

IEC Motors Type Metric Efficient Line Aluminum & Cast-iron

User Manual for Colombia-Venezuela-Ecuador



INSTALLATION

MAINTENANCE

Nidec

NIDEC MOTOR CORPORATION

Safety First

High voltage and rotating parts can cause serious or fatal injury. Qualified personnel must perform safe operation, and maintenance. Familiarization with and adherence to IEC 61508, NEMA MG2, the National Electrical Code (NEC) and local codes is required. It is important to observe safety precautions to protect personnel from possible injury. Personnel should be instructed to:

1. Be familiar with the equipment and read all instructions thoroughly before installing or working on equipment.
2. Avoid contact with energized circuits or rotating parts.
3. Disconnect all power sources before initiating any maintenance or repair.
4. Act with care in accordance with prescribed procedures in handling and lifting this equipment.
5. Be sure unit is electrically grounded in accordance with code requirements.
6. Be sure equipment is properly enclosed or protected to prevent access by children or other unauthorized personnel in order to prevent possible accidents.
7. Be sure shaft key is fully captive before unit is energized.
8. Avoid contact with capacitors until safe discharge procedures have been completed.
9. Provide proper guarding for personnel against rotating parts and applications involving high inertia loads, which can cause over speed.
10. Avoid extended exposure to equipment with high noise levels.

Inspection and Handling

Inspect unit to make sure no damage has occurred during shipment. Check nameplate for correct speed, horsepower, voltage, Hertz, and phase for conformance with power supply and equipment. **WARNING:** Units should be lifted using all eyebolts or lugs if provided. These eyebolts or lugs are provided for lifting this unit only and must not be used to lift any additional weight. Lifting angle, from shank of eyebolt, must not exceed 30° for machines with single and 45° for machines with multiple lifting means. Replacement eyebolts must be per ASTM A489 or equivalent. All eyebolts must be securely tightened. Be careful not to touch overhead power lines with lifting equipment. Failure to observe this warning may result in serious personal injury.

Storage

Units should be stored indoors, in a clean, dry location and winding should be protected from excessive moisture absorption. **NOTE:** If motors are to be stored for more than one year, refer to Nidec Industrial Solutions.

Maintenance

Inspect units at regular intervals. Keep units clean and ventilation openings clear of dust, dirt or other.

WARNING: Disconnect all power sources to the unit and discharge all parts, which may retain an electrical charge before attempting any maintenance or repair. Screen, and covers, must be maintained in place when unit is in operation. Failure to observe this warning may result in personal injury. All actions connected with installations of the motor shall be made by a qualified person.

Grease Lubrication Instructions

Units are prelubricated at the factory and do not require any additional lubrication up to and including frame 160. Above regreasable bearing are used. And motor bearing should be well-lubricated.

Polyrex-EM grease is suitable for ELC and ELA series motor bearing.

Replace motor bearing timely. There should be no abnormal noise and vibration when the motor is working and the temperature of bearing is not exceeding 95°C.

Motor Bearings Re-lubrication Guide				
Motor Frame Size	Number of Poles	Weight of Grease (g)	Interval Hours	Grease Type
160-200	2	30	2000	Polyrex-EM
225-315	2	45		
355	2	75		
160-200	4 & 6	30	4000	
225-280	4 & 6	45		
315-355	4 & 6	75		

NOTE: Motors operating under rated load and allowable ambient conditions may feel hot when touched; this is normal and should not be cause for concern. When in doubt, measure frame surface temperature and confer with nearest office. Enclosed motors normally have condensation drain openings. Insure that drain openings are properly located and open (plugs removed) for the motor mounting position. Drain openings should be at the lowest point of end brackets, frame housing and terminal housing when the motor is installed. This may require modification of motor to accomplish. If unit appears wet, and/or has been stored in a damp location, dry out thoroughly and check for adequate insulation resistance to ground before operating

20 MOhms - for 80 through 112 motor frames

2 MOhms - for 132 through 355 motors frame

as measured with a 500V magneto.

Resistance control device between each phase and frame indicates excess moisture requiring that the windings be dried before installation.

WARNING: Guards should be provided for all exposed rotating parts to prevent possible personal injury. Keep fingers and foreign objects away from ventilation and other openings. Applications involving high inertia loads may damage equipment due to motor over speed during coast shutdown. Such applications should be referred to Nidec Industrial Solution.

CAUTION: Do not force drive coupling or other equipment onto shaft, as bearing damage may result. When connecting the motor with belted pulley machine (air-blower wheel) or any other transmission components, cool-press or heat-sleeve method are recommended, while beating forcedly with hammer is prohibited. Otherwise, it will cause great damage to motor bearing, which leads to abnormal sound or far from normal operation.

Power Supply and Connections

The power supply must agree with values on nameplate. Terminal voltage should not vary more than $\pm 10\%$ of nameplate voltage at rated frequency. Unbalanced line voltage, greater than one percent, can cause overheating. Do not exceed the continuous rated load amperes on the nameplate.

Starting controls and overload protection should be properly sized in accordance with the IEC, NEC and the control manufacturer's recommendations.

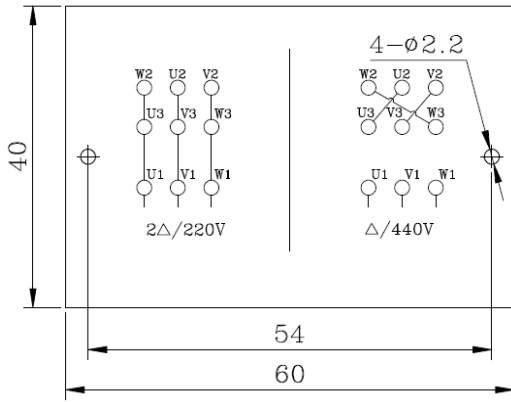
Continuous working under overload condition (electric current exceeding rated value) is strictly prohibited and may damage the windings.

Connecting Data and Starting Methods

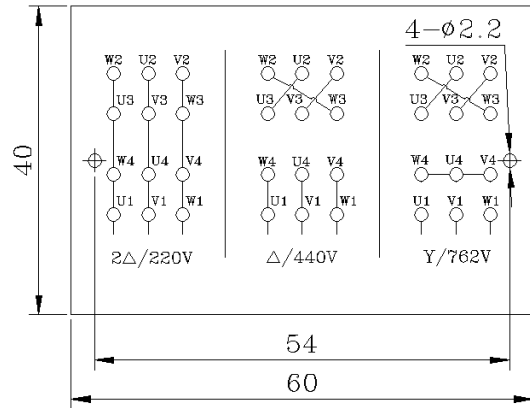
All the motors must be connected according to the following diagrams:

Connection Nameplates

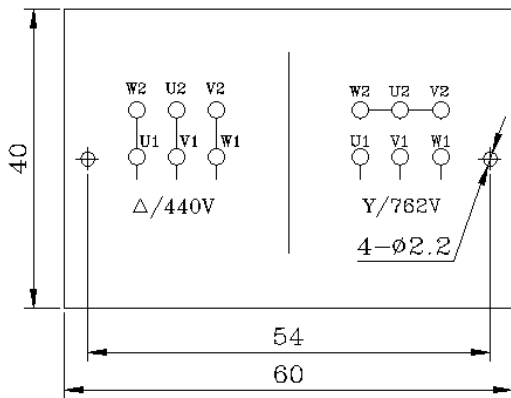
Up to Frame 112



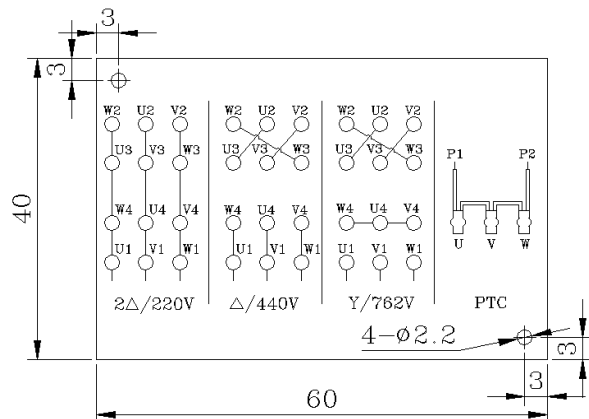
Up to 90Kw from Frames 132 to 280



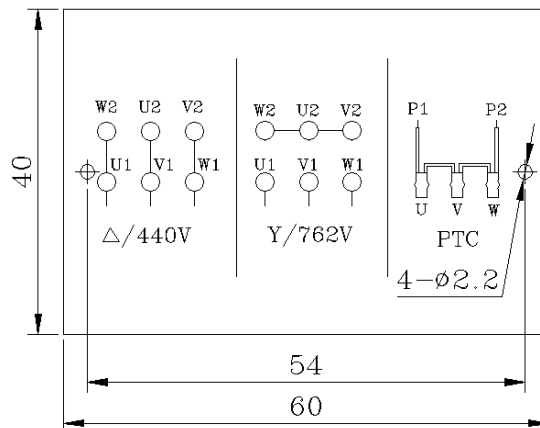
Up to 90Kw from Frames 315 to 355



110Kw and Above on Frames 280



110Kw and Above on Frames 315 and 355



† All marks shown within this document are properties of their respective owners.

Use the connection diagram nameplate of the motor to make the right leads connection. Starting at 110KW and above, motor windings are equipped of PTC Thermistors.

To use the PTC protection, P1-P2 must be connected (see connection nameplate of the motor) to an adequate GRB controller.

When the phase order ABC of main power are corresponding to the binding post marked with U, IV, W1 respectively, the rotating direction of the motor is clockwise.

The motor can test rotating direction at no load when installed. The rotating direction could be changed by changing the phase order of main power in case of need.

Location

WARNING: Use only listed Hazardous Location Motors and /or Atex directive for service in Hazardous Locations as defined in Article 500 of the NEC or IEC60079-10-1, IEC61241-10, IEC60079-10-2.

Units should be located in a clean, well-ventilated area. **WARNING:** Units should be located in a suitable enclosure to prevent access by children or other unauthorized personnel to prevent possible accidents.

Installation Mounting

Motors may be mounted horizontally or vertically, provided that there is free movement for cooling air. The motors are designed for mounting position, IM B3, B6, B7, B8, V5, V6 and F-1 assembly positions. The F-1 assembly is standard. (Conduit box on the side of the motor).

When mounting the motor, make sure drain holes are positioned to allow condensed moisture to drain off. Mount units on a firm, flat surface sufficiently rigid to prevent vibration. Drive belts and chains should be tensioned in accordance with supplier recommendations.

Couplings should be properly aligned and balanced. For belt, chain and gear drive selection refer to the drive or equipment manufacturer. For application of drive equipment refer to applicable information in IEC standards and/or NEMA MG1.

Motors have been dynamically balanced using a half key the same length as the full key shipped with the motor. If pulley keyway length is less than this length, rework long key by removing one-half of excess length between pulley and end of key to maintain balance.

Do not restrict motor ventilation. Unless otherwise specified on nameplate, motor is designed for operation in accordance with NEMA MG1 "Usual Service Conditions" which states an ambient temperature range of -15°C to 40°C (5°F to 104°F), otherwise indicated on the nameplate of the motor.

Standard Altitude is rated 1000m otherwise indicated on the nameplate of the motor. Standard grease lubricated units are suitable for operation within this temperature range; special lubricants may be required for ambient temperatures outside of the range.

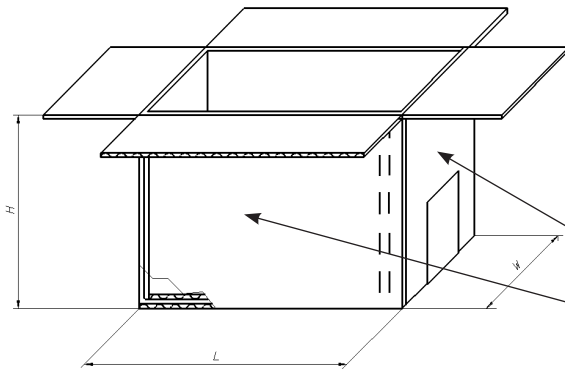
*MELC-315L2-2 and 4 pole and ELC-355 are 105K limit Temp winding

Service

For after sales service and warranty questions refer to www.USMotors.com

Packaging Dimensions & Weights

Small Motors

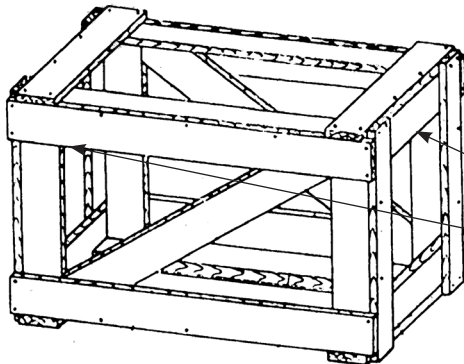


Palette Ground Clearance 100mm

Label (Opposite side of motor nameplate) and adjacent right

Frame		80	90	100	112
L	mm	300	360	405	420
	inches	11.8	14.2	15.9	16.5
W	mm	210	210	260	330
	inches	8.3	8.3	10.2	13.0
H	mm	240	230	270	315
	inches	9.4	9.1	10.6	12.4
Palette Clearance	mm	100	100	100	100
	inches	3.9	3.9	3.9	3.9
Carton Weight	Kg	0.2	0.23	0.38	0.58
	Lbs	0.4	0.5	0.8	1.3

Large Motors



Crate Ground Clearance 100mm

Label (Opposite side of motor nameplate) and adjacent right

Frame		132	160	180	200	225	250	280	315	355
L	mm	620	760	830	880	935	1015	1135	1430	
	inches	24.4	29.9	32.7	34.6	36.8	40.0	44.7	56.3	
W	mm	440	520	545	595	650	735	765	960	
	inches	17.3	20.5	21.5	23.4	25.6	28.9	30.1	37.8	
H	mm	430	480	510	560	630	650	735	845	
	inches	16.9	18.9	20.1	22.0	24.8	25.6	28.9	33.3	
Crate Clearance	mm	100	100	100	100	100	100	100	100	
	inches	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	
Weight	Kg	10	13	15.5	24.5	25	40.5	41	89.5	
	Lbs	22	28.6	34.1	53.9	55	89.1	90.2	196.9	

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